YAMAH5.994APC PATENT

TRAVEL PLANNING SYSTEM

Priority Information

This application is based on and claims priority to Japanese Patent No. HEI 11-292554, filed October 14, 1999, and PCT/JP00/07107, filed October 13, 2000, the entire contents of both which are hereby expressly incorporated by reference.

Background of the Invention

Field of the Invention

This invention relates to a travel planning system that makes definitive plans from vague plans using databases that store large amounts of information in conjunction with a computer.

Background Art

When planning travels, such as touring by motorcycle or automobile, it often happens that one's plans or desires regarding the destination, stopover points, or preferred routes are not always clear from the beginning of the planning; and knowledge about the destination or route is insufficient.

In such cases, preferable destinations may be found by searching for information about sightseeing spots, surrounding areas, or routes, in books, such as, for example, guidebooks.

Searching the guidebooks with the vague plans to select a place or route that matches one's preferences from the large amount of information, often requires repeated searches of many guidebooks, and may require a great amount of time. In some cases, a preferable place may be overlooked, or the place and route may not exactly match the selected preferences. If the latest information is not included in the guidebooks or if arbitrary information is gathered to make a plan, much more time may need to be spent, and one's preferences and wants may not be reflected in the plan.

One object of the present invention is to provide a travel planning system that is capable of accurately and timely selecting, from a large amount of information, destinations and drive-by

points that match one's preferred or final wants with reference to designated sightseeing spots, other places, or surroundings.

Summary of the Invention

One aspect of the present invention provides a travel planning system comprising an interface that accesses a map database and a place database that stores information about places on the map. The travel planning system also includes a monitor screen capable of displaying data in accordance with a program, and information input module for executing the program. The program is characterized by displaying a map on the monitor screen, displaying information about each place on the displayed map, allowing the user to select drive-by points in the travel and/or a destination based on the information displayed, and setting a traveling route according to the selected drive-by points and/or destination.

According to one general architecture, the travel planning system may be implemented using a computer device comprising a database, which includes prestored information about a number of places, and a map. Information about each place is displayed on the monitor screen so that a user can set locations and routes, such as destinations and drive-by points, on the map by looking at the map on the screen and appropriately selecting information displayed with regard to the map. Therefore, a large amount of information can be gathered for display on the screen according to the predetermined programs. Searching and setting of places can be achieved easily within a short time in accordance with the predetermined selection decision criteria.

The travel planning system enables a user to make a journey plan using a large amount of information including not only the information that the user has but also information that has been obtained through external networks such as the Internet. This system makes it possible not only to set a route when a destination is already determined, but to also choose a specific destination and set passage points and routes leading to the destination when the destination itself is not yet determined, according to vaguely desired items, such as, the direction to go (e.g., to the south, toward Yokohama, etc.), seasonal factors (e.g., seeing autumnal leaves, skiing, etc.), or locations the user wants to see (e.g., mountains, waterfalls, shrines, etc.).

In a preferred embodiment, the place database that stores information about places comprises at least one master database that stores predetermined, basic information about each

place and at least one additional database that stores new information about each place. The user is enabled to select one or both for display on the screen described above.

According to the general architecture, the place database that stores information about the places comprises the master database that stores highly reliable information with widely known information from sources such as guidebooks and the additional database includes the latest information and arbitrary information obtained from a third party. By using these databases, destinations and/or drive-by points are selected from a large amount of information, are set accurately and timely, and include one's likes or preferences in accordance with the predetermined selection decision criteria.

In a further preferred embodiment, this invention displays data about each place according to a predetermined ranking method when the place database that stores information about the places described above is displayed on the screen.

According to the general architecture, information about a number of places is displayed in turn under certain rules so that, as the ranking method is specified, information having a higher possibility of being selected is displayed first, settings of places can be made effectively, and possibilities of improper settings are reduced to provide a more satisfactory and suitable planning experience.

Brief Description of the Drawings

FIG. 1 shows a general architecture of a planning system constructed in accordance with one aspect of the present invention.

FIG. 2 is a flowchart illustrating a subroutine for the operation of the planning system shown in FIG. 1.

FIG. 3A is a flowchart illustrating a subroutine for downloading planning data according to the flow of FIG. 2.

FIG. 3B is an exemplary data directory structure.

FIG. 4 is a flowchart illustrating a subroutine for planning using external data.

FIG. 5 shows a modification of the general architecture shown in FIG. 1 utilizing an external network.

FIG. 6 is a block diagram that shows a preferred construction of a general architecture of the travel planning system shown in FIG. 1.

FIG. 7 is a flowchart illustrating a routine for operating a travel planning system in accordance with another aspect of the present invention.

FIG. 8 is a flowchart illustrating a subroutine for the database selection process in the routine as shown in FIG. 7.

FIG. 9 is a flowchart illustrating a subroutine for the ranking method change process in the routine as shown in FIG. 7.

FIG. 10 is a flowchart illustrating a subroutine for the point and route decision process in the routine as shown in FIG. 7.

FIG. 11 is a flowchart illustrating a subroutine for the route decision process in the routine as shown in FIG. 7.

FIG. 12 is a flowchart illustrating a subroutine for the database editing process in the flowchart of FIG. 9.

FIG. 13 is a flowchart illustrating a subroutine for the information acquisition process in the flowchart of FIG. 10.

FIG. 14 is an illustration that shows an example of the first screen displayed as a graphical user interface during the planning operating procedure.

FIG. 15 is an illustration of the screen in a procedure subsequent to the screen shown in FIG. 14.

FIG. 16 is an illustration of the screen in a procedure subsequent to the screen shown in FIG. 15.

FIG. 17 is an illustration of the screen in a procedure subsequent to the screen in FIG. 16.

FIG. 18 is an illustration of the screen in another procedure subsequent to the screen in FIG. 16.

FIG. 19 is an illustration of the screen in which the route to the destination has been set after the procedure shown in FIG. 18.

FIG. 20 is an illustration of the screen in which the modification can be performed after the route has been set in FIG. 19.

FIG. 21 is an explanatory drawing of another embodiment of this invention.

FIG. 22 is an explanatory drawing of still another embodiment of this invention.

FIG. 23 is an explanatory drawing of still another embodiment of this invention.

Detailed Description of the Preferred Embodiments

Embodiments of the invention are described below in reference to appended drawings.

FIG. 1 shows a general architecture of the planning system according to one aspect of this invention.

With reference to FIG. 1, the planning process data from a user is entered into an input device 21, such as a keyboard of a personal computer, and sent through an input interface 22 to a system bus 23 to set a journey plan according to internal and external data. The system bus 23 is connected bidirectionally through an interface 24 to a map database 25, a place database 26 that stores information about a plurality of locations, and a database 27 for other various data. The interface 24 may be either an internal interface or an external interface. For the external interface, various data can be obtained from the outside through a communication network in a specific area or through a personal computer communication network.

The system bus 23 is connected to memory devices, such as a ROM 20 and a RAM 31, to a CPU 32 for performing calculation operations according to the data in such memory devices, and to an output interface 28 in communication with an output device 29, such as a monitor screen or printer. The system bus 23 may also be expanded and connected to other various processing devices and data storage devices.

FIG. 2 is a flowchart of the operation procedure of the planning system shown in FIG. 1. First, the user's ID is verified with a password or a similar procedure (Steps g1 and g2). Next, a choice is made whether a new plan should be created or if an existing plan should be used (Step g3). If an existing plan is to be used, the planning data is downloaded (Step g4) as shown in FIG. 3, which is described below. Presence of the download data is checked (Step g5). If the data is present, a determination is made as to whether a plan should be created according to the data (Step g6). If a plan is to be created, a new planning process is carried out in Step g7. The new planning process may be the same as that of the main routine shown in FIG. 7, which is described below.

If the new planning process has finished or if the plan is not to be created according to the download data in Step g6, a decision is made as to whether the data for the plan should be registered in the user's directory (Step g8). If so, the plan data is registered in the user's directory (Step g9), thereby preventing another person's data from being registered. If registration is intended, the data is registered in the user's directory. Next, a judgment is made as to whether the data is to be output (Step g10). If the data is to be output, the output is made by printing, storing in a file, sending via mail transmission, or entry into a public directory (Step g11). When the output routine is over (Step g12), the planning flow is over.

FIG. 3A is a flowchart of the sub-routine for downloading planning data (Step g4) according to the flowchart of FIG. 2. FIG. 3B is an example data directory structure.

First, as shown in FIG. 3A, a choice is made as to whether the directory of data to be used is one for an individual or a public directory available to a plurality of indefinite third parties (Step h1). If the directory is an individual's, the user's ID is checked with a password (Step h2). If a plurality of directories for individuals is present, as shown in FIG. 3B, one of them is selected, its data contents are displayed, a determination is made as to whether the directory is to be chosen, and if it is to be chosen, the data is downloaded (Step h3). If a public directory is selected from the plurality of directories, the process is similar to the above; one directory is selected, its data contents are displayed, a determination is made as to whether the directory is to be chosen, and if it is to be chosen, the data is downloaded (Step h4).

FIG. 4 is a flowchart of an example process of using existing planning data through the Internet or the like. This process corresponds to the flow after choosing in Step g3 either creating new planning data, as shown in FIG. 2, or utilizing existing data.

If existing data is utilized through an Internet server, first a judgment is made as to whether data registered in the server or data available through the server is to be used (Step j1). If the server data is to be used, the index of the data is taken in as the user's index data, and the data contents are stored in a temporary file of the user (Step j2). A judgment is made as to whether it is necessary to add items and/or corrections to the contents data (Step j3). If additions and/or corrections are necessary, the subject data from the temporary file is stored as the user's personal data (Step j4). Thereafter, the data which is stored as the user's data is adapted to the user's desire to make a new plan (Step j5). This new planning is the same process as the above-

described new planning process, and implemented, for example, according to the flow shown in FIG. 7, which is described below.

If the new planning process is over or the planning data from the server is used without any additions or corrections, the data is displayed for verification, and printing or downloading data to mobile devices is prepared or carried out (Step j6). A judgment is made as to whether the planning data is to be made open to the public and registered (Step j7). If the data to be registered in the index only ('yes' in Step j8), the original data is directly registered. If the data contents are also to be registered ('no' in Step j8), the user's data, which is newly created, added, or corrected, is uploaded and registered on the server side (Step j9).

FIG. 5 shows a general architecture of a planning system utilizing an external network such as the Internet.

A planning process 51 is implemented according to the input data 52 and the data obtained from the Internet 53. The planning process results and data are displayed 54. If the planning data is to be downloaded from the Internet 53, the data is first temporarily recorded and stored in a temporary file 55. Only the index recorded first in the temporary file 55 is recorded in the user's data 56. If the user himself carries out the planning by editing the data, or by making additions and/or corrections, the planning data is transferred from the temporary file 55 to the user's data file 56.

Fig. 6 shows a block diagram of the travel planning system related to one embodiment of the invention.

A system database 1 and a user community database 2 that includes information about a large number of places are connected to a ranking module 3. The system database 1 includes a preformed database that the system originally has and also a master database that includes highly reliable data with widely known information about sightseeing spots and the surroundings as seen in guidebooks.

The user community is a group comprised of multiple users that utilize this system and allows the users to mutually exchange their information through the system. The user community database 2 includes information relating to the sightseeing spots and the other places collected from members of the community and is an additional database that includes new data, one's preferences, and arbitrary elements formed after the system was built. Therefore, the

reliability of the database is not as high as the system database, but it may be provided with fresh and updated information.

Both the system database 1 and the user community database 2 store information about places and may include image data, such as, pictures of the places and their respective positions on the map, as well as the time spent inputting the data and creating the data and notes, such as particularity and sightseeing spots of the places that are added as information.

The system database 1 and the user community database 2 are connected to the ranking module 3. The ranking module 3 is connected to the monitor screen (not shown) and the specified image information of the system database 1 and/or the user community database 2 is displayed in turn on the monitor, based upon the ranking method being set. This ranking module 3 is related to a ranking method for ranking the data, and is an operating procedure or module for inputting or selecting the command and data in the routine executing a program. The ranking module 3 works by input operating module such as a keyboard or a mouse (same as the other module described hereafter).

A database selection module 4 interacts with the system database 1, the user community database 2, and the ranking module 3. The database selection module 4 selects either one or both of the databases as available information for the planning hereinafter set forth.

The ranking of information is determined in accordance with selecting conditions of information from the community of members and a popularity poll intentionally made by an administrator to form the database of the rankings of the user community 5. This database of user community rankings 5 is connected to the ranking module 3 for use with the ranking method.

A map database 6 is provided with map data, for example, map data of all over Japan, and can be scaled appropriately for display on the screen. As two points on the map displayed on the screen are selected, an automatic route selection module 7, a point and route decision module 8, and a route decision module 9 set the route in accordance with data in a route database 10 as described below.

The ranking module 3 described above is also connected to a history database 11, a keyword input module 12, a random number generation module 13, and a ranking database 14 for use with the ranking methods.

The ranking database 11 is one of the databases that records data, such as, the data utilized by users as the ranking method of the past and previously searched data.

The keyword input module 12 comprises a keyboard for entering keywords and/or for inputting rankings into a computer to execute a program.

The random number generation module 13 is used for displaying the information in the random ranking method.

The ranking database 14 is provided with data, such as keywords and images, for the ranking. The ranking database 14 determines the rank order of searching information, including the data of places displayed, according to the similarity between the information in the database when the ranking method by the database is selected.

In the present system, a user preferences database 15 is provided as an editable database. This database 15 can store information using a data acquisition module 17 when the information is found in the plans. The ranking database 14 and the user preferences database 15 are connected to an edit module 16 to allow editing, such as additions or deletions, and arrangements. The information in the user preferences database 15 is connected to the ranking module 3 through the ranking database 14 and may provide information for determining the ranking methods and the drive-by points in a travel plan.

Each database to be used with the ranking methods is respectively connected through a ranking method change module 18 to the ranking module 3. As described hereinafter, the ranking method is selected by the ranking method change module 18; each database is utilized in accordance with the selected ranking method; and the data to be searched and displayed on the monitor is ranked based upon the database.

Next, the flow of programmed planning is described in the planning system with the above general architecture in reference to the flowcharts of FIGS. 7-13 and FIGS. 14-20 that illustrate examples of displays.

FIG. 7 shows a flowchart of a routine for the entire system.

The illustrated flow of the entire system comprises four processes including the loops as described below, from which any process can be started. The ranking is also optional.

First, it is determined whether the searching database selection process is to be carried out (Step S1). If the selection process is not to be carried out, the process proceeds to the next step

(Step S3). If the selection process is to be carried out, the database selection is processed (Step S2). This database selection process selects between the system database 1 and the user community database 2 with regard to the places to be searched, as described above, and the database selection process details, which are described in reference to FIG. 3 above.

In the next step (Step S3), it is determined whether the ranking method change process is to be carried out. If the ranking method change process is not to be carried out, the process proceeds to the next step (Step S5). If the ranking method change process is to be carried out, the ranking method change is processed (Step S4). The ranking method change process is a method for setting the order of data displayed on the screen, and its details are described in reference to FIG. 9 below.

In Step S5, it is determined whether the points and routes decision process is to be carried out. If this decision process is not to be carried out, the process proceeds to the next step (Step S7). If the points and routes decision process is to be carried out, the points and routes decision is processed (Step S6). The points and routes decision process is a method of setting drive-by points of the route on the map in the screen, and its details are described in reference to FIG. 10 below.

In Step S7, it is determined whether the route decision process is to be carried out. If the route decision process is not to be carried out, the process proceeds to Step S9. If the route decision process is to be carried out, the route decision is processed (Step S8). The route decision process is a method of setting routes between points when the points are set on the map in the screen, and its details are described in reference to FIG. 11 below. If the route decision process is not to be carried out, it is determined whether the main routine of the planning is to be terminated (Step S9). If the main routine is not to be terminated, the flow is returned to Step S1 and continues until it is terminated.

FIG. 8 shows a flowchart of a subroutine of the database selection process discussed above as Step S2.

At Step a1, it is determined whether the system database 1 (shown in FIG. 6) is to be used as the object to be searched. If the system database is to be used, the system database 1 is selected (Step a2). Step a3 is a step for determining whether the user community database 2 (see FIG. 6) is to be used. If the user community database is to be used, the user community database

2 is selected (Step a4). According to Steps a1 through a4, either one or both of the system database 1 and user community database 2 are selected to be searched for object or decision criteria and/or for determining what data should be displayed on the screen when setting points on the travel route.

The next steps set the time and position to be searched.

In Step a5, it is determined whether the time range to be searched is to be specified. If so, the command for specifying the time range is entered (Step a6). This specified time range defines the information to be searched according to the period, season, days of the week, month, and time for traveling. The object to be searched is limited in accordance with the time information specified or stored in the database information.

Next, in Step a7, it is determined whether the area range to be searched is to be selected. The area range determines the range of the map displayed on the screen which is to be searched (See FIG. 14 for example). If the displayed range is acceptable, the "Setting OK" button is clicked, and then this flow is terminated. When another area range is selected, it is determined whether the map on the screen is to be moved at Step a8. If it is to be moved, the map is moved to display another area with the scale remaining the same (Step a9). If a larger area, including the area already shown, is intended to be displayed, or the area being displayed is intended to be displayed in more detail, the scale of the map is changed to zoom in or out (Step a10).

FIG. 9 shows a flowchart of a subroutine illustrating the ranking method change process discussed as Step S4 in FIG. 7 above.

This process determines the method for setting the display order on the screen when more than one item of displayed searched information is selected. At start up, the system starts from the previous condition as it was set during the last exit from the system. For the first time using the system, the ranking is preset to display the items in random order.

Beginning with Step b1, it is determined whether the user preferences database 15 (FIG. 6) and the ranking database 14 (FIG. 6) are to be edited. If editing is selected, each database is edited using edit module 16 (FIG. 6) as described below in reference to FIG. 12 (Step b2). In addition, for the present embodiment, the user preferences database 15 is an image database.

Then, in Step b3, the ranking method is selected. The ranking method is selected among the following five methods, Steps b4 through b8.

Step b4 is a ranking process that ranks according to the ranking database 14. In this step, the similarities are calculated and quantitatively compared with image information stored in the ranking database 14. The ranking is placed in order based upon the similarities. Alternatively, keywords can be used as the decision criteria of ranking and can be stored in the ranking database 14 to place the data, including the information similar to the keywords, in order.

Step b5 is a ranking process that ranks according to the database of user community rankings 5 (FIG. 6). In this step, the information to be displayed is placed in order of popular information using the selecting conditions of a plurality of other users.

Step b6 is a process of ranking that ranks the information to be displayed totally randomly using the random number generation module 13 (FIG. 6).

Step b7 is a process of ranking that ranks according to all-time history information using the history database 11 (FIG. 6). In this step, the displayed information in the screen map is placed in order based on history information of the past, such as, similar information, notes, and keywords used by the users. The history information is based on the information previously set by the users as points of travel.

Step b8 is a process of ranking that ranks according to the input characters. Keywords are input (Step b9) and used to search and rank the information to be displayed using the words in the notes of information in the database selected to be searched. In this example, several keywords can be preset in the system, and similarities may be determined to place the displayed information in order according to the plurality of keywords. In such case, keywords preset in the system can be preferably added, deleted, and edited.

FIG. 10 shows a flowchart of a subroutine of the point and route decision process (Step S6 in FIG. 7).

In the beginning, a map is displayed on the screen (Step c1). It is determined whether the rough route has been already decided (Step c2). If the rough route has been decided, the rough route is input by selecting or "clicking" the points on the route in the map (Step c3). In FIG. 14, for example, the rough route has been already decided, wherein the starting point is Hamamatsu, and the destination (i.e., point of destination) is Yatsugatake. The drive-by points on the way are set by clicking on the map. Next, the map is scaled appropriately to bring the position on the map back to the initial set point (i.e., starting point) (Step c4).

Users can change the scale of the map; however, the scale is adjusted such that the amount of information within the displayed map is initially set at one hundred. The scale of the map is displayed as minimum when the route or destination is not determined.

Among the information selected in the database selection process described in FIG. 8 above, information within the displayed map is placed in order according to the method set in the ranking selection process routine of FIG. 9 described above (Step c5). According to the ranking, a predetermined amount of image data is displayed (e.g., 20 images) and is ordered based on the highest ranking (Step c6). The determination is then made as to whether preferable or fully satisfying information is shown in the displayed images (Step c7). If there is favorable information, the information is recorded in the ranking database 14 (FIG. 6) and/or the user preferences database 15 with the information acquisition module 17 (FIG. 6) as shown in FIG. 13 (Step c8).

This favorable information is used to set to a point of travel (Step c9). As the point is set, the location is displayed on the map (Step c10). In FIG. 10, for instance, as BB pond is selected and clicked as the preferable image among the plurality of image information displayed on the screen with the ranking (four images in this example), the color of the information changes, and its location is displayed on the map. In FIG. 15, a mouse pointer 20 is positioned on BB pond, and BB pond is set as a traveling point.

If there is no favorable information within the image data displayed in Step c7 described above, the information acquisition process (Step c8) is not carried out. Next, it is determined whether there is any information to set as a traveling point (Step c12), and if there is information to set as a traveling point, its location is clicked on the map to set the traveling point (Step c13).

As described above, when a traveling point is set on the map, a detailed route is determined according to the set information (Step c11). This route is determined automatically by the system with the automatic route selection module 7 (FIG. 6) according to the point being set on the map and displayed on the map in the screen. Users cannot change the setting of the route. The setting change of the route by the user is carried out in the route decision process described below.

When the route is determined, the flow is returned to Step c7, and it is determined again whether there is any further information to be set, such as a traveling point, in accordance with

the plurality of image data information shown on the screen. If there are no more points to be set, the process, with respect to the plurality of image data being displayed on the screen, is terminated. The set traveling routes and points in this state are determined whether they are to be set as the final route and points (Step c14). This routine is terminated if it is the final setting. If it is not the final setting, a plurality of image data (e.g., 20 images, or 4 images as in FIG. 15) of the subsequent ranking image data is displayed. Next, it is determined whether to consider the subsequent ranking information (Step c15). If the subsequent ranking information is intended to be seen, this information is displayed (Step c16). The routine of the previous Steps c7 through c14 are repeated by returning to Step c7 using this new image information.

If the new image information of the subsequent ranking does not need to be displayed, it is determined whether the map scale should be changed and zoomed in the range or whether the detail is to be examined (Step c17). If the scale is to be changed, the scale of the map on the screen is changed (Step c18), then the flow returns to Step c5, and the routine work described above is repeated.

If the scale is not changed, it is determined whether the rough route has already been decided (Step c19). If it has not been decided, the map is zoomed out (Step c20), the flow is returned to the Step c5, and the above routine work is repeated until the rough route is decided.

When the rough route has been decided, it is determined whether the examination of all information on the rough route is finished (Step c21). If it is not finished, the course of the pointer is forwarded along the route on the map (Step c22), the flow is returned to Step c5, and the above routine work is repeated until all information on the routes is finished.

The system can be designed to show all of the information within the displayed range as the user finishes and pushes or selects the "Next" button ("→") on the bottom of the screen (see FIGS. 14 and 15). When the rough route is entered, the system automatically moves the map on the screen in the direction of the rough route to display the new information (see FIG. 16).

As the user finishes viewing the information within the displayed range and pushes or selects the "Next" button when the rough route is not set, the system can automatically reduce the magnification of the map on the screen, expand the information to be searched, rank the information that may become the new searching object in accordance with the ranking method, and display several sets of information from the higher ranking in turns.

If information in the vicinity of the route is selected when the route has been already displayed, the system automatically modifies the route. For example, as shown in FIG. 17, if Mt. Kinpu (JJ Mountains) is clicked after Mt. Fuji is set as a point, the route between Mt. Fuji and Mt. Kinpu is set automatically. Additionally, if Ootsuki (KK Tower) is clicked, Ootsuki is set as a point of travel, and the route passing through Ootsuki is automatically set as shown in FIG. 18.

A position not having (or not displaying) information can also be set as a travel point by clicking on the map directly.

The "Next" button ("→") can be selected to forward the mouse pointer 20 along the route, and when it reaches the last point of the route being roughly set (Yatsuga-take in this example), the routine of the points and routes decision process is terminated (FIG. 20).

After the route has been set (FIG. 19), the points that were already set can be deleted by clicking the image information once again or the point on the map, for instance. The route is automatically modified without the deleted points. For example, when Numazu is clicked to be deleted from the route in the example of FIG. 19, the route is automatically set without Numazu as shown in FIG. 20.

FIG. 11 shows a flowchart of a subroutine of the route decision process (Step S8 in FIG. 7).

At the beginning, it is determined whether the plurality of traveling points has already been set on the map on the screen (Step d1). If the plurality of points has been set, it is determined whether the route has already been set (Step d2). If the route has been set, it is determined whether other routes also need to be examined (Step d3). If they need to be examined, several recommended routes are shown (Step d5). These recommended routes are displayed on the screen based on the route data stored in the route database 10 (Fig. 6). The automatic route selection module 7 (Fig. 6) automatically selects several routes in accordance with the points that have already been set. The user can select the best-suited route from the displayed recommended routes. The recommended routes are automatically determined based on criteria, such as one way, round trip, or shortest distance. From these recommended routes, only the routes that are considered to be suitable are displayed based on the user preference data or the common routes data.

In Step d6, it is determined whether there are any better routes among the recommended routes, and if there are, the most appropriate one is selected (Step d7). Whether the route is modified or not is determined in accordance with this new recommended route (Step d8). If it is modified, the routes between the points are re-connected (Step d9).

After the routes between these points are re-connected, if there are no better routes at Step d6, or if the route is not modified at Step d8, it is determined whether the route decision process is terminated (Step d10). If the route decision process is not terminated, it is determined whether the modification, by adding or deleting the points, is to be carried out (Step d11). If the modification is to be carried out, the map is clicked to add or delete points (Step d4), and then the flow is returned to the above Step d5 to automatically select and display the recommended routes. The routine as described above is repeated until the flow is terminated.

The difference between such route decision process as shown in FIG. 11, and the route decision process in FIG. 10 is as follows: the points and route decision process of FIG. 10 is centered on the determination of the points while viewing the image information; the route decision is automatically made by the system; and the users are not allowed to change the setting of the route. The route decision process of FIG. 11, however, is centered on the user's determination of the route, and although the system can also display the recommended route automatically, the detailed route is set by the user.

FIG. 12 shows a flowchart of the editing process of the user preference database 15 and the ranking database 14 (subroutine of Step b2 in FIG. 9).

At Step e1, it is determined whether data is to be registered from the user preference database 15 (FIG. 6) to the ranking database 14 (FIG. 6) (Step e1). If the data is to be registered, image data to be registered is selected from the user preference database 15 (Step e2), and then the selected image data is stored in the ranking database 14 (Step e3).

If it is not to be registered in the ranking database 14 in Step e1, it is determined whether the image data is to be deleted from the user preference database 15 (Step e4). If it is to be deleted, the image data to be deleted is selected (Step e5), and the selected image data is deleted from the user preference database 15 (Step e6).

If the image data is not to be deleted from the user preference database 15 in Step e4, it is determined whether the image data is to be deleted from the ranking database 14 (Step e7). If it

is to be deleted, the image data to be deleted is selected from the ranking database 14 (Step e8), and the selected image data is deleted (Step e9).

FIG. 13 shows a flowchart of a subroutine of the information acquisition process (Step c8 of the flowchart of the point and route decision process in FIG. 10). This process stores certain information in the ranking database 14 and/or the user preference database 15 using the information acquisition module 17 (FIG. 6).

First, if there is any preferable information (Step c7 in FIG. 10), it is determined whether the information is to be stored in the user preference database 15 (Step f1). If it is to be stored, the information is registered in the user preference database 15 (Step f2).

Then, it is determined whether the above preferable information is to be stored in the ranking database 14 (Step f3). If it is to be stored, the information is registered in the ranking database (Step f4).

FIGS. 21 to 23 are explanatory drawings of other embodiments of the invention. In these embodiments, the monitor screen shows not only points (indicated with black dots) representing places (place names), but also routes which pass through the points.

In the example of FIG. 21, routes R1, R2, and R3, which pass the points around the pointer 20, are displayed. These routes R1, R2, and R3 are shown from the route data within the display range in order of priority.

In the example of FIG. 22, routes R4 and R5, which pass the current place indicated with the pointer 20, are displayed.

In the example of FIG. 23, routes R6, R7, R8, and R9, which pass the current place indicated with the pointer 20 and lead to the next places, are displayed.

The data of routes R1 and R2 is stored beforehand in the user's database or in other users' storage.

Practical Applications

As described above, this invention uses a computer device having a map database and a database of information including data about many places. A user can access a large amount of data through external networks, such as the Internet, to display information about various places as well as a map on a monitor screen. The user can see the map on the screen and appropriately

choose from the information displayed in the map. The user may also set destinations, places as passage points, and routes on the map. This makes it possible, according to a predetermined program, to sort and display many pieces of information on the screen, to easily search places on the basis of predetermined choosing criteria within a short period of time, and to set preferable places. Therefore, it is possible to arrange a plan from a set of vague, indefinite destinations by clearly sorting ideas, on the basis of general information, the user's preferences, and various journey data, such as data on the popularity of other people, without looking over places and without committing setting errors. It is also possible to make a plan in which routes, passage points, as well as destinations are correctly set.